

Extra Practice

Quadratics

Solve each equation by graphing. When necessary, round your answer to the nearest hundredth.

35. $x^2 + 4x - 1 = 0$

36. $4x^2 - 100 = 0$

37. $x^2 = -2x + 1$

38. $x^2 - 9 = 0$

39. $2x^2 + 4x = 70$

40. $x^2 - 30 = 10$

41. $x^2 + 4x = 0$

42. $x^2 + 3x + 2 = 0$

43. $x^2 = 8x - 16$

44. Hal's sister is 5 years older than Hal. The product of their ages is 456. How old are Hal and his sister?

45. A toy rocket is fired upward from the ground. The relation between its height h , in feet, and the time t from launch, in seconds, can be described by the equation $h = -16t^2 + 64t$. How long does the rocket stay more than 48 feet above the ground?

46. The expression $P(x) = 2500x - 2x^2$ describes the profit of a company that customizes bulldozers when it customizes x bulldozers in a month.

- How many bulldozers per month must the company customize to make the maximum possible profit? What is the maximum profit?
- Describe a reasonable domain and range for the function $P(x)$.
- For what number of bulldozers per month is the profit at least \$750,000?

Put each equation in vertex form.

49. $x^2 + 5x + 8 = 4$

50. $2x^2 - 5x + 1 = 0$

51. $x^2 - 7x = 0$

52. $x^2 + 4x + 4 = 0$

53. $x^2 - 7 = 0$

54. $x^2 + 8x - 17 = 0$

Evaluate the discriminant of each equation. Tell how many real solutions each equation has.

55. $x^2 + 4x = 17$

56. $2x^2 + x = -1$

57. $x^2 - 4x + 5 = 0$

58. $2x^2 + 5x = 0$

59. $x^2 - 19 = 1$

60. $3x^2 = 8x - 4$

61. $-2x^2 + 1 = 7x$

62. $4x^2 + 4x = -1$

63. $x^2 + 16 = 0$

Extra Practice

64. The height y of a parabolic arch is given by $y = -\frac{1}{16}x^2 + 40$, where x is the horizontal distance from the center of the base of the arch. All distances are in feet.
- What is the highest point on the arch?
 - How wide is the arch at the base to the nearest tenth of a foot?
65. An archer's arrow follows a parabolic path. The path of the arrow can be described by the equation $y = -0.005x^2 + 2x + 5$.
- Describe the meaning of the y -intercept of the graph of the equation.
 - What is the horizontal distance the arrow travels before it hits the ground? Round your answer to the nearest foot.

Simplify each number by using the imaginary number i .

66. $\sqrt{-9}$

67. $\sqrt{-36}$

68. $\sqrt{-80}$

69. $\sqrt{-289}$

70. $\sqrt{-175}$

71. $\sqrt{-117}$

Simplify each expression.

72. $(3 - i) + (5 - 2i)$

73. $(4 + 2i)(1 - i)$

74. $(4 + 2i) - (3 + 5i)$

75. $(8 - 3i)(6 + 9i)$

76. $(2 + 5i) - (-6 + i)$

77. $(-2 - 3i)(7 - i)$